WM-35/45

SERVICE MANUAL

AL 11

WM-45:

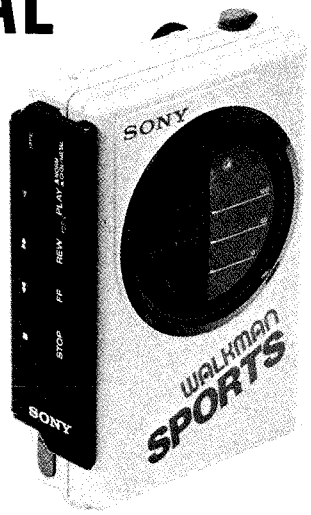
US Model

Canadian Model

WM-35:

AEP Model

UK Model



SPECIFICATIONS

Tape Transport Mechanism Type	MF-WMF45

Frequency response 40–15,000 Hz (with metal tapes or CrO_2 tapes)
40–15,000 Hz (with normal tapes)

Power requirements 3 V dc, two Size AA batteries (IEC designation R6)

Battery life (hours)

Batteries	Playback
Sony Eveready AM3 alkaline or Eveready No. 91 alkaline	8
Sony SUM-3(NS) New Super or Eveready No. 1015	4

For maximum performance, we recommend the use of alkaline batteries.

Dimensions Approx. 106 x 140 x 43 mm (w/h/d)
(4 1/4 x 5 5/8 x 1 3/4 inches)
incl. projecting parts and controls
Approx. 89 x 137 x 37 mm (w/h/d)
(3 5/8 x 5 1/2 x 1 1/2 inches)
excl. projecting parts and controls

Weight Approx. 330 g (12 oz) incl. batteries excl. other accessories

Accessories supplied Stereo headphones (1 pair open air type)
Belt clip (1)

MICROFILM

STEREO CASSETTE PLAYER

SONY®

TC

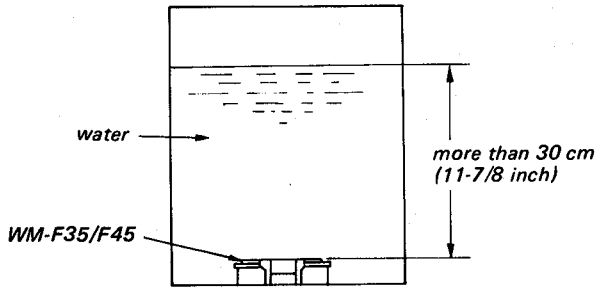
NOTE ON REPAIR

This model is waterproof, so be sure to confirm waterproofing after repair.

WATERPROOF CHECK

(1) Insert batteries or a cassette tape in the set. (So that it will sink.)

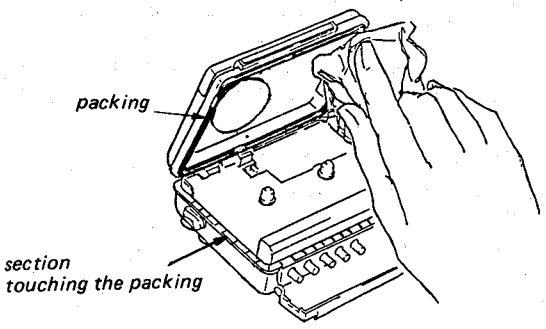
(2) Place in more than 30 cm of water for 30 minutes. (Close DC jack and packing firmly.)



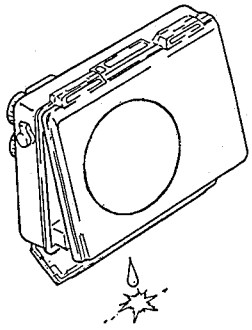
(3) Remove from the water after 30 minutes and wipe off all moisture.

(4) Check all operations. (If water has entered, abnormal operation will occur.)

(5) Open the cassette case and wipe off all moisture on the packing and case sections touching the packing.



(6) Shake the set and confirm that no water comes out.

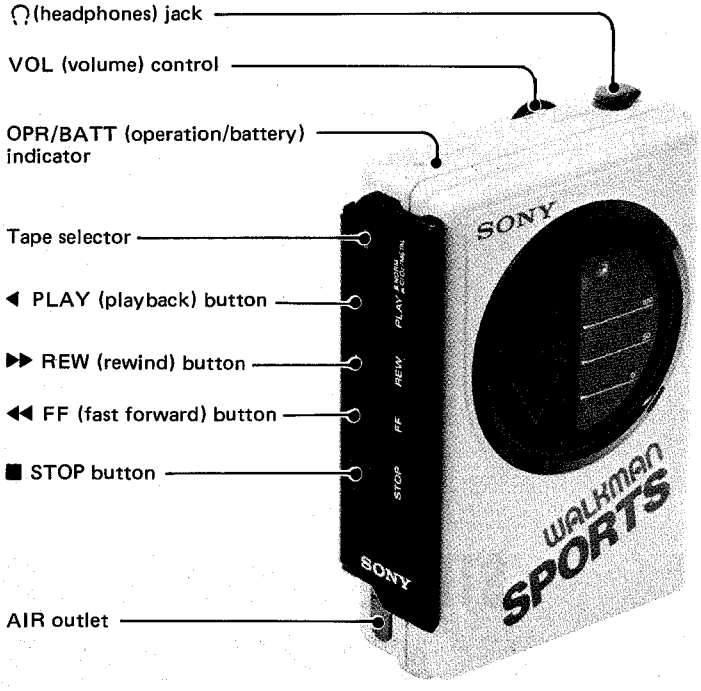


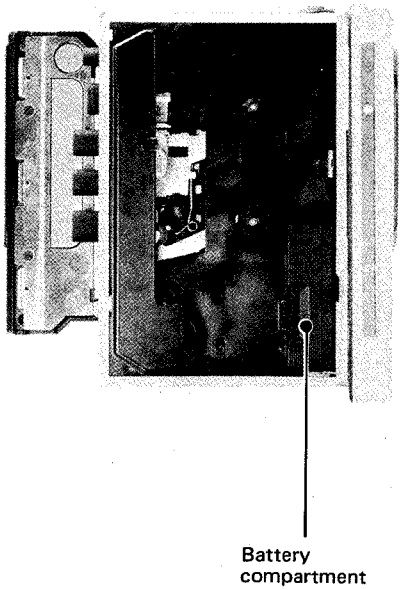
(7) When waterproofing is confirmed, mount the ornamental sheet and ornamental plate assy (A). (Wipe off the water on the screw to prevent rusting.)

IF LEAKAGE OCCURS DURING WATERPROOF CHECK:

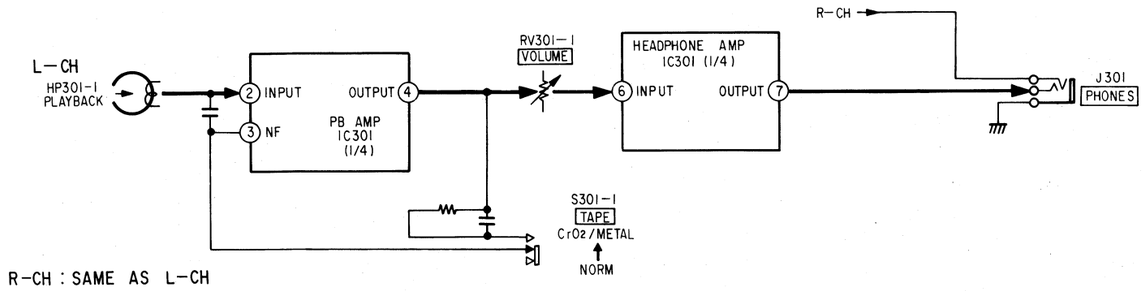
Dry the mechanism section and amp board, jack, etc. with a hairdryer, perform waterproofing procedures again and recheck starting with step (1).

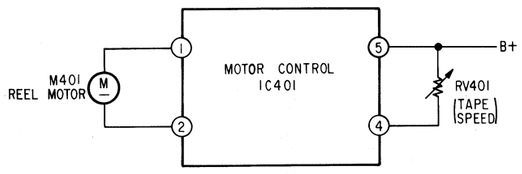
PARTS IDENTIFICATION





SECTION 1
BLOCK DIAGRAM

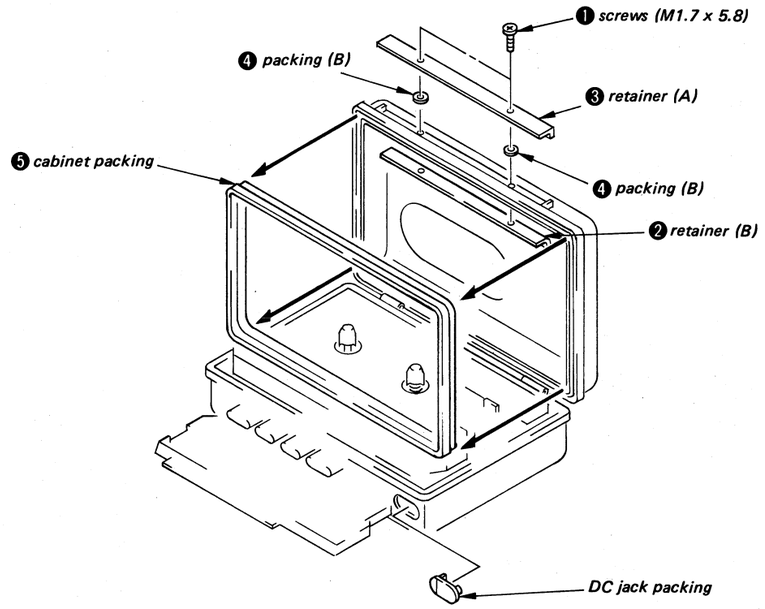




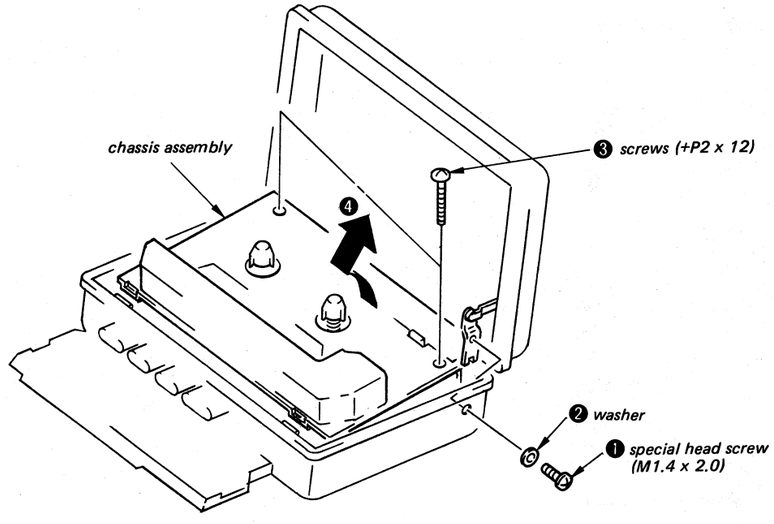
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

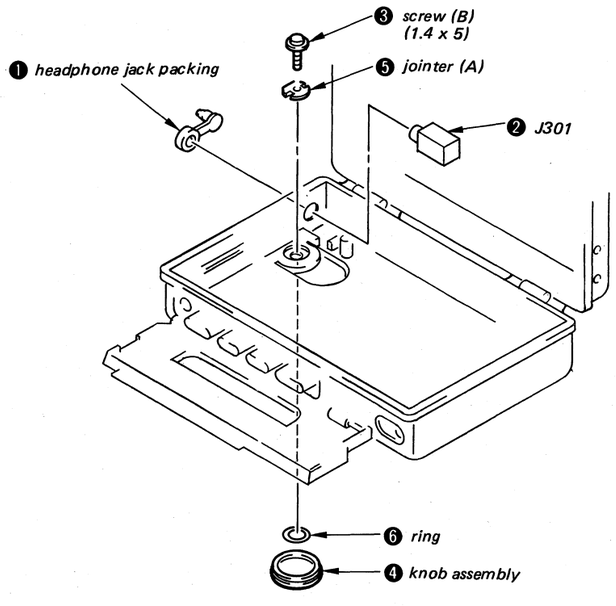
PACKINGS



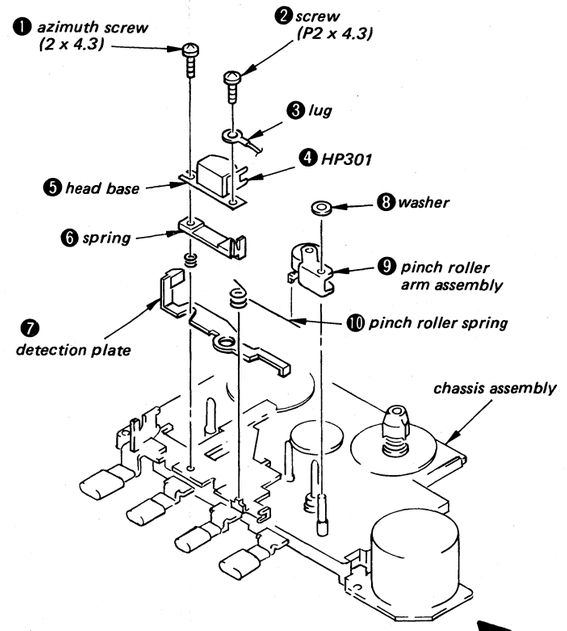
CHASSIS ASSEMBLY



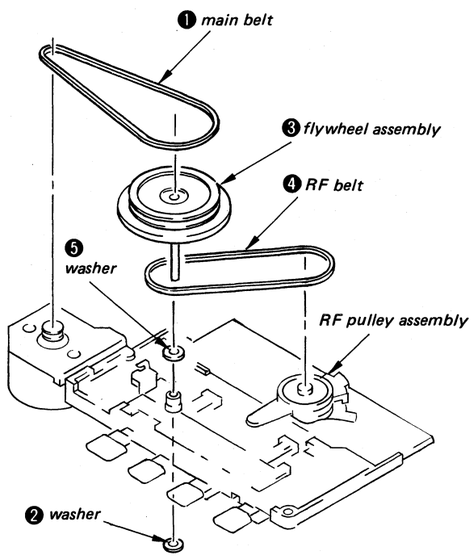
VOLUME KNOB, HEADPHONE JACK (J301)



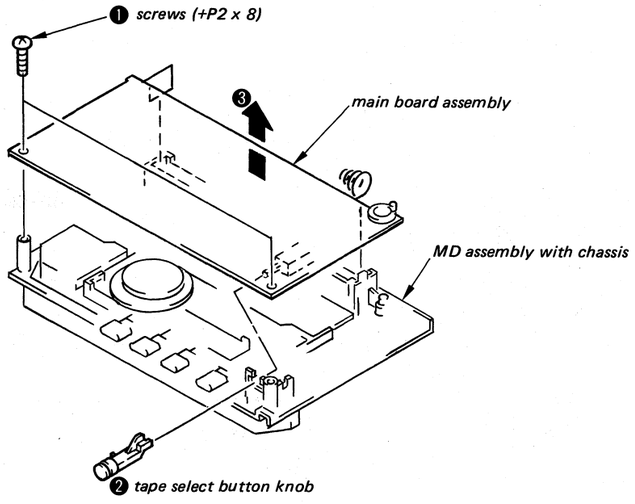
PB HEAD AND PINCH ROLLER ASSEMBLY



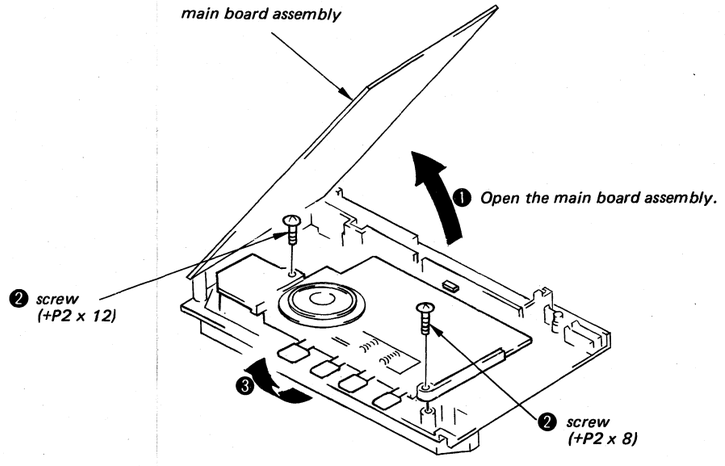
DRIVING BELTS AND FLYWHEEL ASSEMBLY



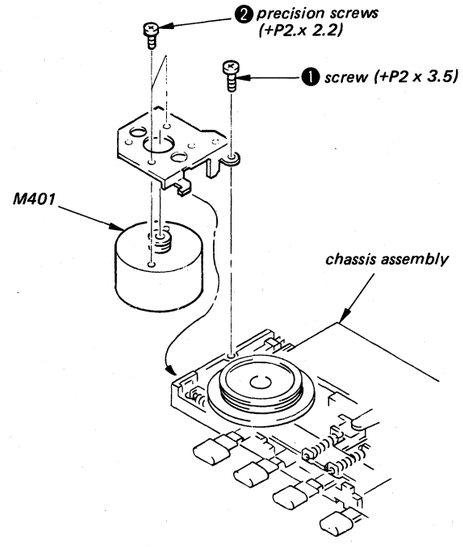
MAIN BOARD ASSEMBLY



MD ASSEMBLY



MOTOR ASSEMBLY



SECTION 3
ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers

2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

3-1. MECHANICAL ADJUSTMENT

TORQUE MEASUREMENT

Mode	Torque meter	Meter reading
FWD	CQ-102C	20 – 35 g·cm (0.28 – 0.49 oz·inch)
FWD Back Tension		2 – 4.5 g·cm (0.03 – 0.06 oz·inch)
REV	CQ-102RB	20 – 35 g·cm (0.28 – 0.49 oz·inch)
REV Back Tension		2 – 4.5 g·cm (0.03 – 0.06 oz·inch)
FF, REW	CQ-201B	more than 60 g·cm (0.83 oz·inch)

TAPE TENSION MEASUREMENT

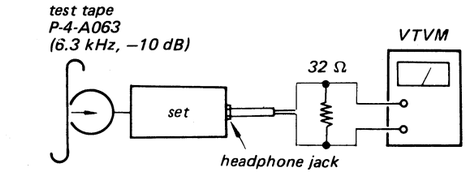
Mode	Tension meter	Meter reading
FWD	CQ-403A	more than 60 g (2.1 oz)
REV	CQ-403R	more than 60 g (2.1 oz)

3-2. ELECTRICAL ADJUSTMENTS

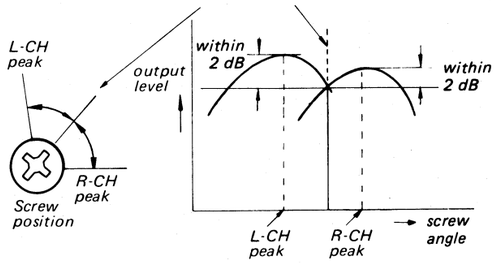
PB Head Azimuth Adjustment

Procedure:

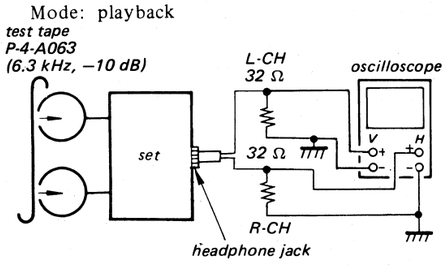
1. Mode: playback

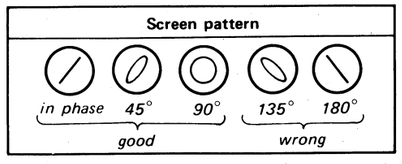


2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 2 dB.

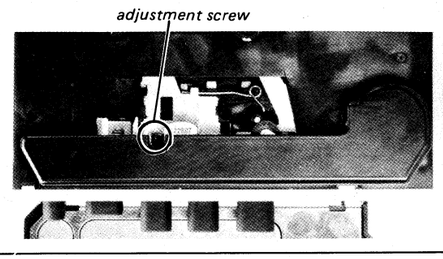


3. Phase Check
   Mode: playback





Adjustment Location:



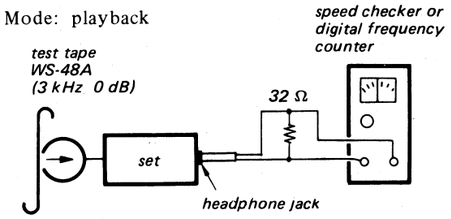
Tape Speed Adjustment

Setting:

VOL control: mechanical mid

Procedure:

Mode: playback

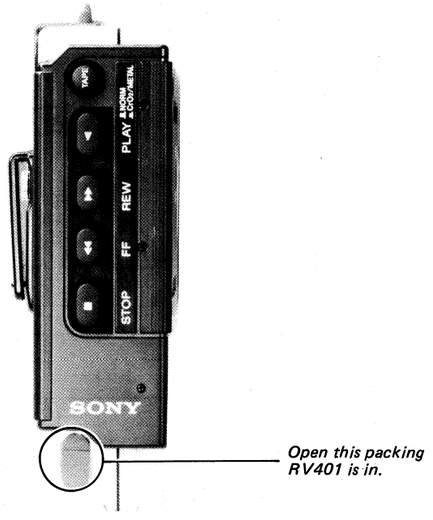


- Play back the center of the tape in FWD mode and adjust RV401 for the specification.
- The specification should be satisfied in any condition of tape top, tape end, high and low voltage, vertical and horizontal stand.

Specification:

Speed checker	Digital frequency counter
±3%	2,910 – 3,090 Hz

Adjustment Location:

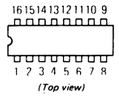


SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM — *Conductor Side* —

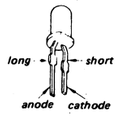
- **Semiconductor Lead Layouts**

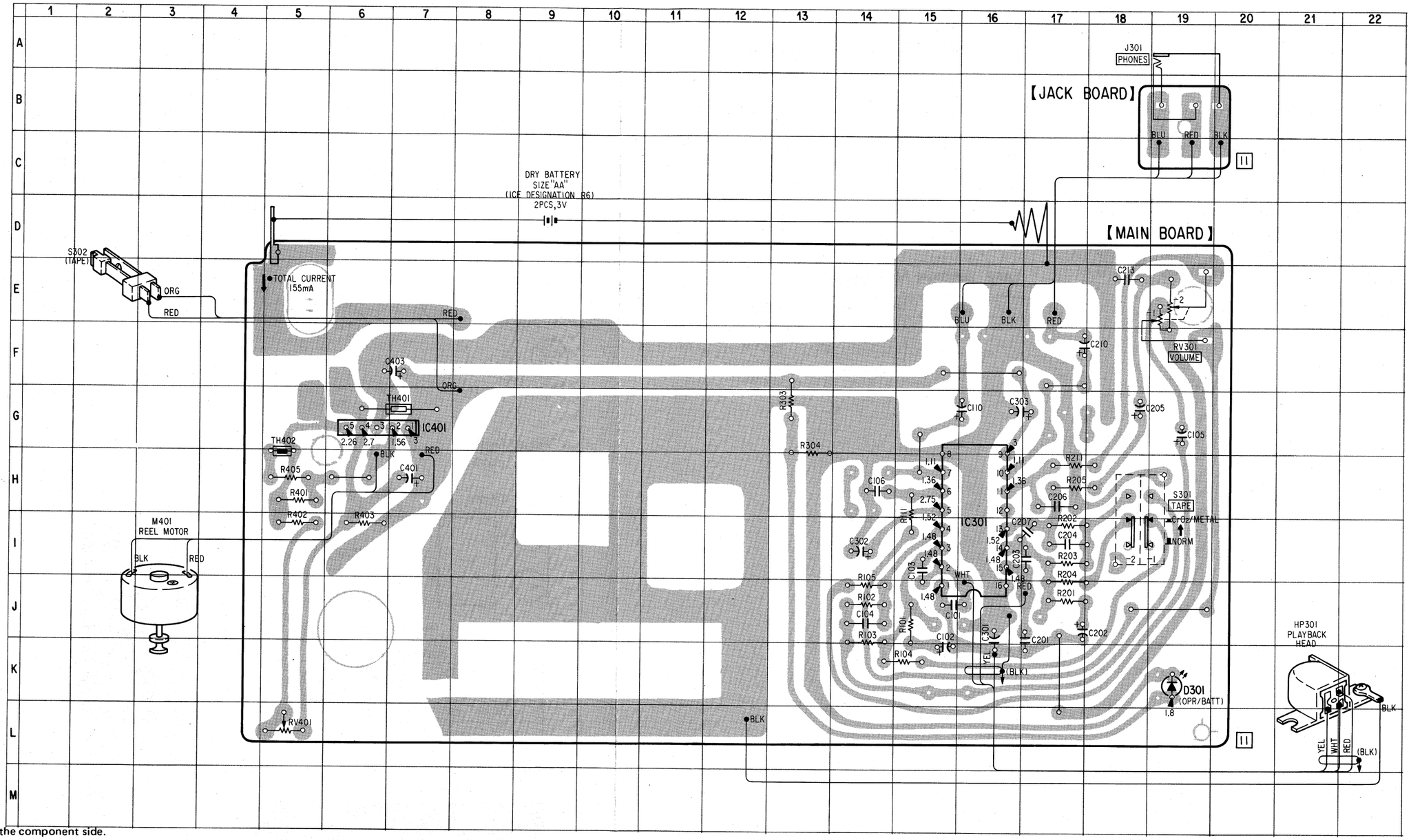
LA4570



LA5523

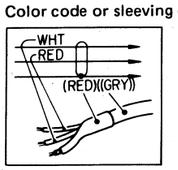
TLR124





Note:

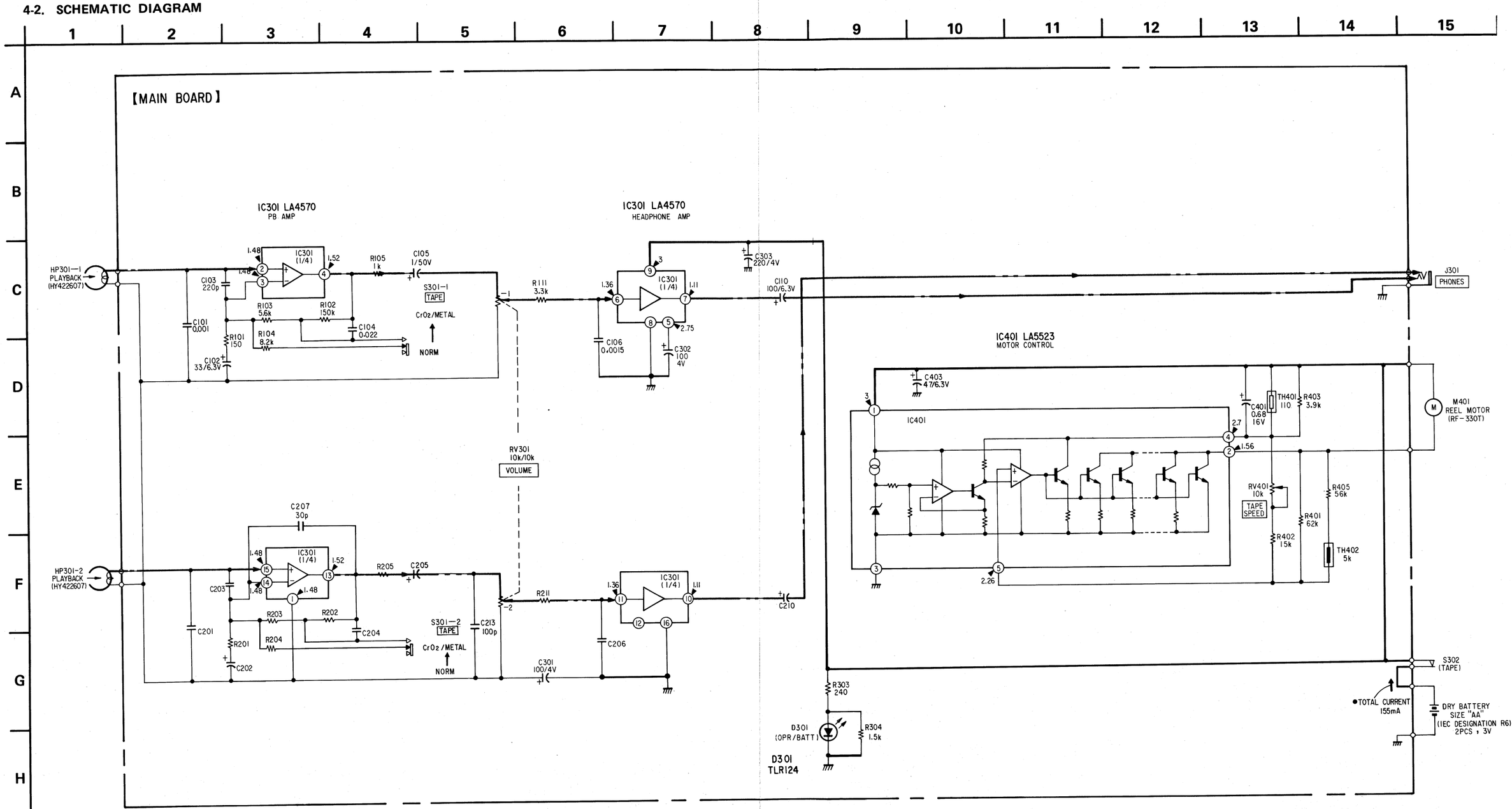
- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ■ : part mounted on the conductor side.
- ○-○ component-side pattern.
- Color code or sleeving over the end of the jacket.



- **SEMICONDUCTOR LOCATION**

Ref. No.	Location
D301	K-19
IC301	I-16
IC401	G-6

4-2. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/6 W or less unless otherwise specified.
- Components for right channel have same values as for left channel. Reference numbers are coded from 201.

- ▬▬ : B+ bus.
- ▭ : adjustment for repair.
- Total current is measured with no cassette installed. no mark: TAPE MODE

- Power voltage is DC 3 V and fed with regulated dc power supply from DC IN 3 V jack.
  Voltages are dc with respect to ground in no signal mode.
  Voltage variations may be noted due to normal production tolerances.
- ▬▶▬ : signal path.
- ▬·▶ : L-CH signal path.
- ▬··▶ : R-CH signal path.

- Switch

Ref. No.	Switch	Position
S301	(TAPE SELECT) CrO2, METAL/NORMAL	NORMAL
S302	(TAPE)	ON

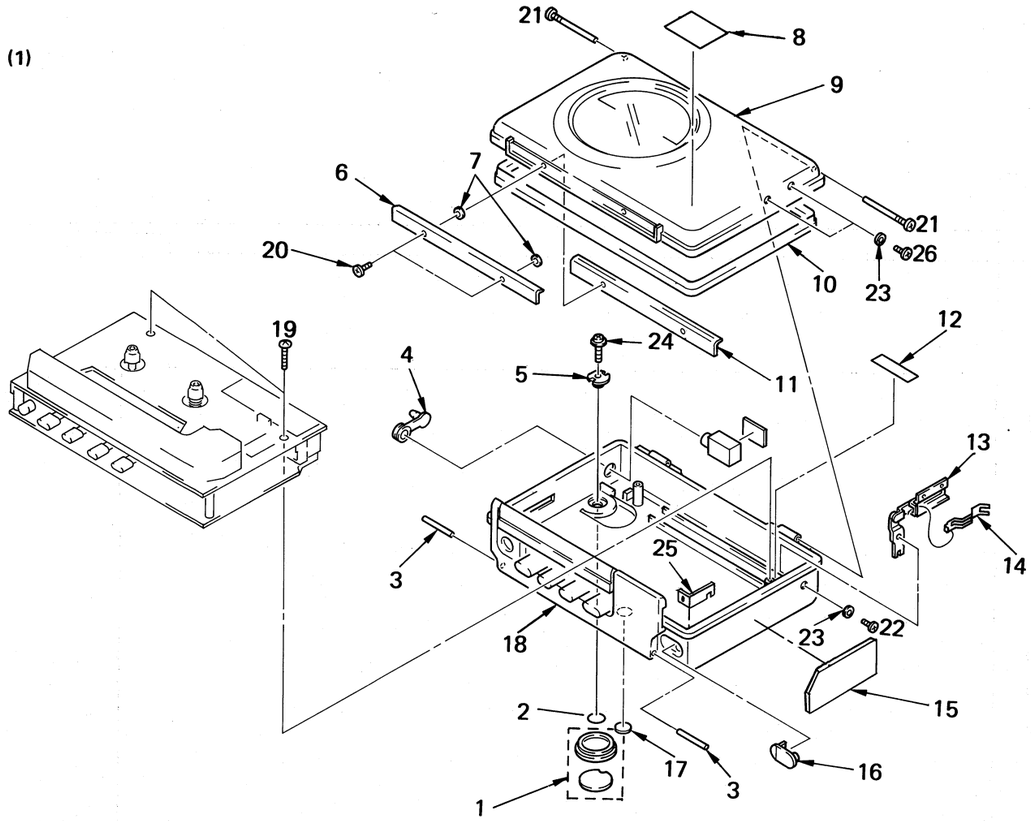
SECTION 5
EXPLODED VIEWS AND PARTS LIST

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.

Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

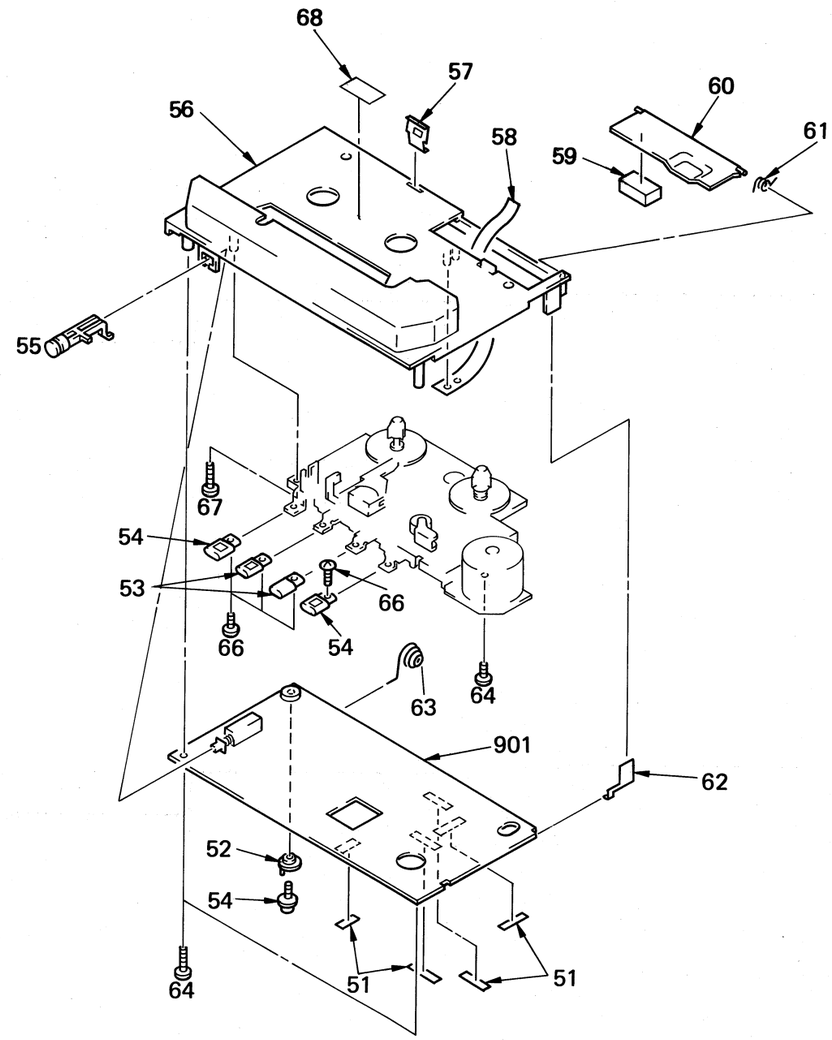
- The construction parts of an assembled part are indicated with a collation number in the remark column.

(1)



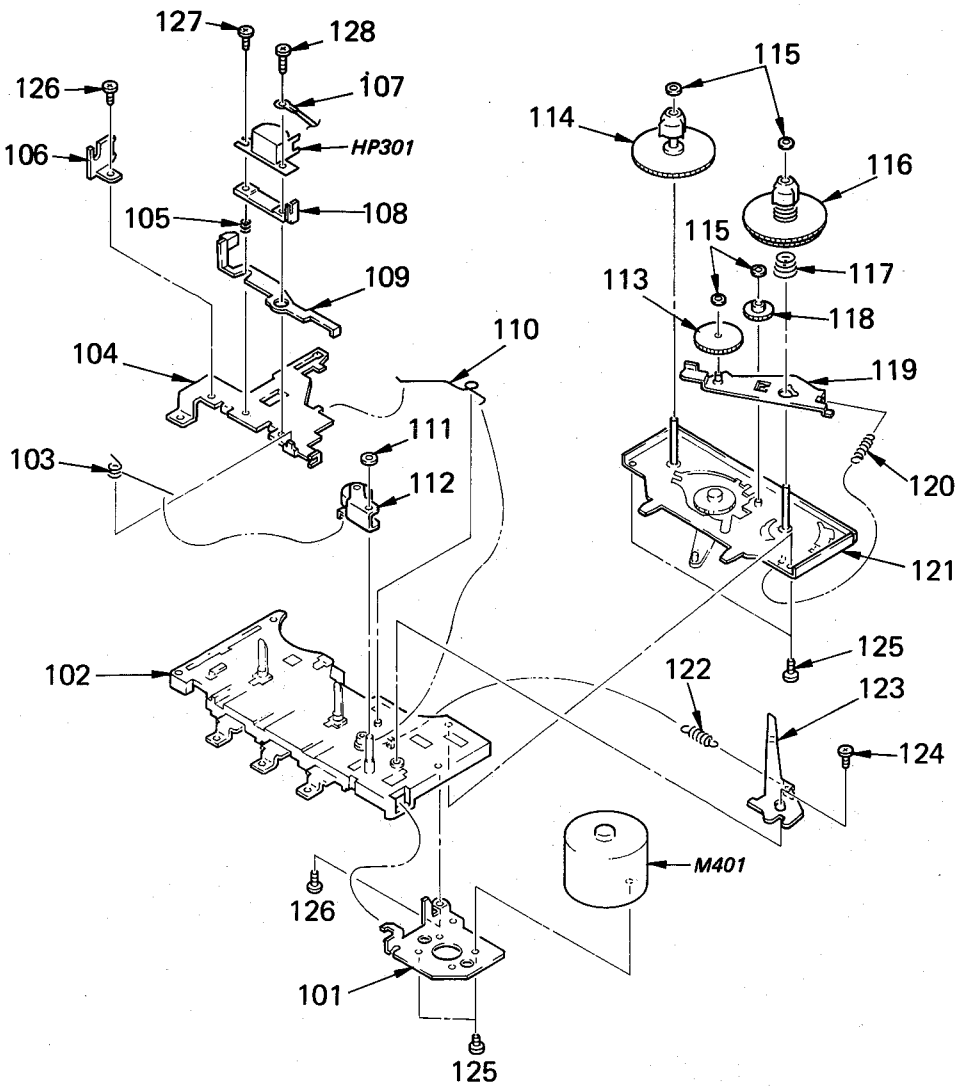
No.	Part No.	Description	Remarks
1	X-3334-024-1	(35:YELLOW/45)...KNOB ASSY	
	X-3334-024-2	(35:BLUE).....KNOB ASSY	
	X-3334-024-3	(35:GREY/45:Canadian:GREY)...KNOB ASSY	
2	3-326-573-01	RING (DIA.4.9X DIA.7.1), O	
3	3-649-266-00	PIN, PARALLEL	
4	3-326-520-01	PACKING, HP JACK	
5	3-334-018-01	JOINTER (A)	
6	3-334-021-01	RETAINER (A)	
7	3-326-149-01	PACKING (B)	
8	3-703-709-00	STICKER, SONY SYMBOL (15)	
9	X-3334-032-1	(45:US).....CABINET ASSY, FRONT	
	X-3334-032-2	(45:Canadian:YELLOW)..CABINET ASSY, FRONT	
	X-3334-032-3	(35:YELLOW).....CABINET ASSY, FRONT	
	X-3334-032-4	(35:BLUE).....CABINET ASSY, FRONT	
	X-3334-032-5	(35:GREY).....CABINET ASSY, FRONT	
	X-3334-032-6	(45:Canadian:GREY)...CABINET ASSY, FRONT	
10	3-334-010-01	PACKING, CABINET	
11	*3-334-022-01	RETAINER (B)	
12	3-527-213-00	LABEL, SERIAL NUMBER	
13	X-3326-102-1	PLATE ASSY, CLICK	
14	3-326-549-01	SPRING	
15	3-335-633-01	(45:Canadian)...LABEL, MODEL NUMBER	
	3-335-634-01	(35:UK).....LABEL, MODEL NUMBER	
16	3-312-826-00	PACKING, DC JACK	
17	3-312-841-00	(YELLOW)...PLATE (A), ORNAMENTAL, SCREW	
	3-312-841-60	(BLUE).....PLATE (A), ORNAMENTAL, SCREW	
	3-312-841-80	(GREY).....PLATE (A), ORNAMENTAL, SCREW	
18	X-3334-033-1	(45:US).....CABINET ASSY, REAR	
	X-3334-033-2	(35:UK:YELLOW/45:Canadian:YELLOW) .....CABINET ASSY, REAR	
	X-3334-033-3	(35:UK:BLUE).....CABINET ASSY, REAR	
	X-3334-033-4	(35:UK:GREY/45:Canadian:GREY) .....CABINET ASSY, REAR	
	X-3334-033-5	(35:AEP:YELLOW)...CABINET ASSY, REAR	
	X-3334-033-6	(35:AEP:BLUE).....CABINET ASSY, REAR	
	X-3334-033-7	(35:AEP:GREY).....CABINET ASSY, REAR	
19	7-685-107-19	SCREW +P 2X12 TYPE2 NON-SLIT	
20	3-326-145-11	SCREW (M1.7X5.8)	
21	3-326-536-11	SCREW, TAPPING	
22	3-703-816-01	SCREW (M1.4X2.0), SPECIAL HEAD	
23	3-326-135-01	WASHER	
24	3-318-201-21	SCREW (B) (1.4X5), TAPPING	
25	*3-335-647-01	PLATE, BLIND	
26	3-703-816-41	SCREW (M1.4X2.5), SPECIAL HEAD	
902	*1-619-270-11	PC BOARD, JACK	
J301	1-563-298-11	JACK (SMALL TYPE) (DIA. 3.5)	

(2)



No.	Part No.	Description	Remarks
51	3-831-441-XX	SPACER, KNOB	
52	3-334-019-01	JOINTER (B)	
53	3-334-015-01	BUTTON (B), MD	
54	3-334-014-01	BUTTON (A), MD	
55	3-335-628-01	BUTTON, TAPE	
56	3-335-630-01	CHASSIS	
57	3-326-112-01	SPRING	
58	3-334-028-01	RIBBON, BATTERY	
59	9-911-815-02	CUSHION, ANTENNA HOLDER	
60	3-334-029-01	LID, BATTERY CASE	
61	3-326-134-01	SPRING, TORSION	
62	3-326-115-01	TERMINAL BOARD, BATTERY	
63	3-335-627-01	SPRING	
64	7-685-105-14	TPG +P 2X8, TYPE 2, NON-SLIT	
65	3-703-502-41	SCREW	
66	3-318-204-01	SCREW (M1.7X2.5), TAPPING	
67	7-685-107-11	SCREW +P 2X12 TYPE2 NON-SLIT	
68	3-335-648-01	PLATE, ORNAMENTAL	
901	*A-3070-167-A	MOUNTED PCB, MAIN	

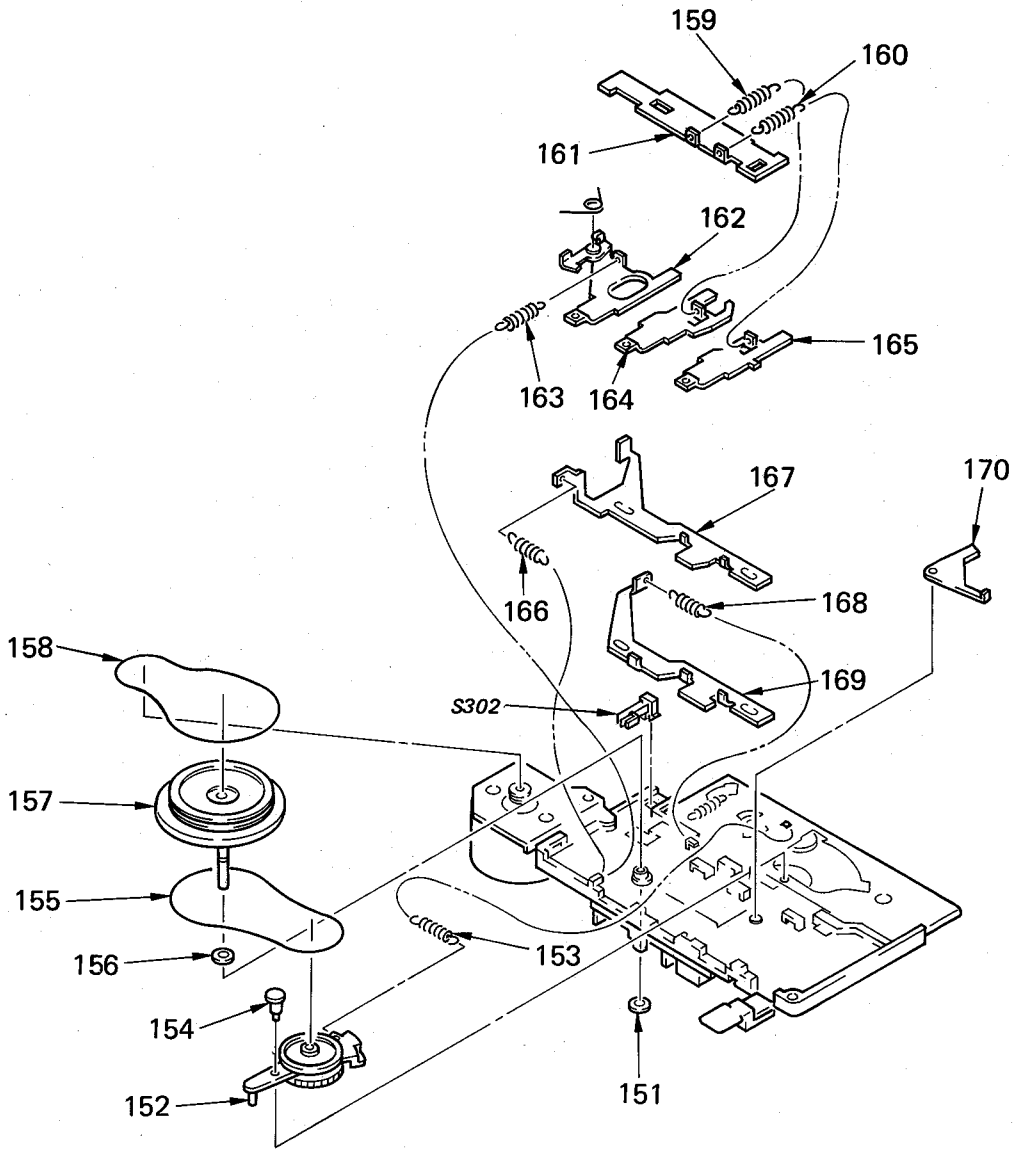
(3)



No.	Part No.	Description	Remarks
101	*3-596-961-01	BRACKET, MOTOR	
102	3-596-953-01	CHASSIS ASSY	
103	3-596-957-01	SP, PINCH ROLLER	
104	*3-596-954-01	PANEL, HEAD	
105	3-596-907-01	SPRING	
106	3-596-904-01	GUIDE, TAPE	
107	7-623-505-01	LUG, 2	
108	3-596-965-01	BASE, H	
109	*3-596-955-01	PLATE ASSY, DIRECTION	
110	3-596-903-01	SPRING	
111	3-596-962-01	SCREW (P.W 1.6X3.8XO.3)	
112	3-596-913-01	ARM ASSY, PINCH ROLLER	
113	3-596-940-01	GEAR, T ROLLER	
114	3-596-935-01	REEL ASSY, SUPPLY	
115	3-596-937-01	SCREW (1.2X3XO.25)	

No.	Part No.	Description	Remarks
116	3-596-934-01	REEL ASSY, TAKE-UP	
117	3-596-936-01	SPRING	
118	3-596-941-01	GEAR, FF	
119	3-596-938-01	RIVETING, TG PLATE	
120	3-596-939-01	SPRING	
121	3-596-933-01	RIVETING, REEL PC BOARD	
122	3-596-914-01	SPRING	
123	*3-596-951-01	LEVER, AUTO	
124	3-596-952-01	SCREW, AL	
125	7-627-554-07	SCREW, PRECISION +P 2X2.2	
126	7-627-554-18	+P 2X3.5	
127	3-596-967-01	SCREW (2X4.3), AZIMUTH	
128	3-596-967-01	SCREW (PLUS MINUS P 2X4.3)	
HP301	3-596-956-01	HEAD, PLAYBACK	
M401	3-596-968-01	PULLEY ASSY, MOTOR	

(4)



No.	Part No.	Description	Remarks
151	3-596-932-01	SCREW (1.55X3.8X0.5)	
152	3-596-943-01	PULLEY ASSY, RF	
153	3-596-944-01	SPRING	
154	3-596-945-01	SCREW, ARM COLLAR	
155	3-596-931-01	BELT, RF	
156	3-701-437-11	WASHER	
157	3-596-959-01	FLYWHEEL ASSY	
158	3-596-930-01	BELT, MAIN	
159	3-596-923-01	SPRING	
160	3-596-925-01	SPRING	

No.	Part No.	Description	Remarks
161	3-596-926-01	RETAINER	
162	*3-596-963-01	LEVER, STOP BUTTON	
163	3-596-920-01	SPRING	
164	3-596-922-01	LEVER, FF BUTTON	
165	3-596-924-01	LEVER, RWD BUTTON	
166	3-596-927-01	SPRING	
167	3-596-918-01	PLATE, FUNCTION, SW	
168	3-596-917-01	SPRING	
169	3-596-916-01	PLATE, FUNCTION	
170	3-596-915-01	LEVER, RWD	
S302	3-596-958-01	LEAF, SW	

SECTION 6
ELECTRICAL PARTS LIST

NOTE:
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*A-3070-167-A	MOUNTED PCB, MAIN			
902	*1-619-270-11	PC BOARD, JACK			
C101	1-102-074-00	CERAMIC	0.001MF	10%	50V
C102	1-123-646-00	ELECT	33MF	20%	6.3V
C103	1-102-110-00	CERAMIC	220PF	10%	50V
C104	1-161-055-00	CERAMIC	0.022MF	10%	25V
C105	1-123-611-00	ELECT	1MF	20%	50V
C106	1-102-119-00	CERAMIC	0.0015MF	10%	50V
C110	1-123-661-00	ELECT	100MF	20%	6.3V
C204	1-161-055-00	CERAMIC	0.022MF	10%	25V
C201	1-102-074-00	CERAMIC	0.001MF	10%	50V
C202	1-123-646-00	ELECT	33MF	20%	6.3V
C203	1-102-110-00	CERAMIC	220PF	10%	50V
C205	1-123-611-00	ELECT	1MF	20%	50V
C206	1-102-119-00	CERAMIC	0.0015MF	10%	50V
C207	1-102-962-00	CERAMIC	30PF	5%	50V
C210	1-123-661-00	ELECT	100MF	20%	6.3V
C213	1-102-106-00	CERAMIC	100PF	10%	50V
C301	1-124-433-00	ELECT	100MF	20%	4V
C302	1-124-433-00	ELECT	100MF	20%	4V
C303	1-124-434-00	ELECT	220MF	20%	4V
C401	1-131-415-00	TANTALUM	0.68MF	20%	16V
C403	1-123-647-00	ELECT	47MF	20%	6.3V
D301	8-719-812-41	DIODE TLR124			
HP301	3-596-956-01	HEAD, PLAYBACK			
IC301	8-759-802-85	IC LA4570			
IC401	8-759-801-12	IC LA5523			
J301	1-563-298-11	JACK (SMALL TYPE) (DIA. 3.5)			
M401	3-596-968-01	PULLEY ASSY, MOTOR			
R101	1-247-811-00	CARBON	150	5%	1/6W
R102	1-247-883-00	CARBON	150K	5%	1/6W
R103	1-247-849-00	CARBON	5.6K	5%	1/6W
R104	1-247-853-00	CARBON	8.2K	5%	1/6W
R105	1-249-417-11	CARBON	1K	5%	1/6W
R111	1-249-423-11	CARBON	3.3K	5%	1/6W
R201	1-247-811-00	CARBON	150	5%	1/6W
R202	1-247-883-00	CARBON	150K	5%	1/6W
R203	1-247-849-00	CARBON	5.6K	5%	1/6W
R204	1-247-853-00	CARBON	8.2K	5%	1/6W
R205	1-249-417-11	CARBON	1K	5%	1/6W
R211	1-249-423-11	CARBON	3.3K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R303	1-247-816-00	CARBON	240	5%	1/6W
R304	1-249-419-11	CARBON	1.5K	5%	1/6W
R401	1-247-874-00	CARBON	62K	5%	1/6W
R402	1-247-859-00	CARBON	15K	5%	1/6W
R403	1-247-845-00	CARBON	3.9K	5%	1/6W
R405	1-247-873-00	CARBON	56K	5%	1/6W
RV301	1-230-593-11	RES, VAR, CARBON 10K/10K			
RV401	1-230-775-11	RES, ADJ, CARBON 10K			
S301	1-570-177-11	SWITCH, PUSH (1 KEY)			
S302	3-596-958-01	LEAF, SW			
TH401	1-807-222-11	THERMISTOR (POSITIVE)			
TH402	1-800-279-21	THERMISTOR 5K			

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-326-162-01	WASHER, POLYETHYLENE, SLIT
3-334-035-01	CUSHION (B)
3-334-036-01	CUSHION (A)
3-335-621-01	MASTER CARTON, 6 SETS SUB
3-335-620-01	(45:US).....INDIVIDUAL CARTON
3-335-654-01	(35:UK).....INDIVIDUAL CARTON
3-335-655-01	(35:AEP).....INDIVIDUAL CARTON
3-335-656-01	(45:Canadian)...INDIVIDUAL CARTON
3-527-213-00	LABEL, SERIAL NUMBER
3-701-624-00	BAG, POLYETHYLENE
3-703-485-11	BAG, POLYETHYLENE
3-765-240-11	(35)...MANUAL, INSTRUCTION
3-765-240-21	(45)...MANUAL, INSTRUCTION
3-765-240-31	(45:Canadian)...MANUAL, INSTRUCTION
3-765-240-41	(35:AEP).....MANUAL, INSTRUCTION
3-795-748-21	(45:US)...SAFETY INSTRUCTIONS, HEADPHONE
3-831-441-XX	CUSHION, SPEAKER
3-831-441-XX	SPACER
8-952-261-90	(35:YELLOW/45)...HEADPHONE MDR-W15L/Y SET
8-952-261-91	(35:BLUE).....HEADPHONE MDR-W15L/L SET
8-952-261-92	(35:GREY).....HEADPHONE MDR-W15L/G SET
X-3334-001-1	CASE ASSY, CARRYING